

MISSOURI CONSERVATIONIST

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Serving Nature & You



Vantage Point

Missouri Conservation— A Civics Lesson

History was one of my favorite classes in school. Probably because my Carter County R-1 High School Civics and American History teacher was Mr. J. S. (Jim) Allen.

Mr. Allen was a passionate educator who cared deeply that students appreciated the subject matter. He developed a specialty in state government and the Missouri constitution during his two terms in the Missouri House of Representatives. Mr. Allen stressed the uniqueness of Missouri governance and the importance of Missourians' right to amend their constitution through initiative petition.

Missouri conservationists successfully used the initiative petition process twice. In 1936, voters created the Conservation Commission, and in 1976 they established a dedicated conservation sales tax. As a result, Missouri is ahead of most other states in fish, forest and wildlife management programs.

In the late 1930s, Aldo Leopold, who is often proclaimed conservation's greatest philosopher, wrote about the new Commission and its chances for success. He said:

Conservation, at bottom, rests on the conviction that there are things in this world more important than dollar signs and ciphers. Many of these other things attach to the land, and to the life that is on it and in it. People who know these things have been growing scarcer but less so in Missouri than elsewhere. This is why conservation is possible here.

In our state capitol, we work hard to share this story and the effectiveness of today's conservation programs with our elected officials. Since term limits became effective in 2000, over 100 Missouri Senators and Representatives reached the maximum years of service.

Some of their replacements appear less supportive of conservation governance as we know it.

During the 2005 session, a small group of Missouri House members tried to reduce the funding available for the Department. Three times, they attempted to withhold \$25 million from the agency, even though voters placed budget authority in the Conservation

Commission. Another group of legislators attempted to establish seasons, methods and limits for the harvest of catfish and carp. This is also an area traditionally recognized as a responsibility of the Conservation Commission. These challenges reinforce the need to constantly educate elected officials about our conservation constitutional legacy.

Meanwhile, elected officials elsewhere have taken note of Missouri's conservation successes and are striving to learn from them. The Governor of Minnesota is advancing a proposal that essentially mimics Missouri's program, including an independent citizen commission to oversee agency operations and a permanent, dedicated sales tax.

Missouri conservation is unique because citizens voted to fund and manage fish, forests and wildlife through the Conservation Commission. The program's success is rooted in the most fundamental of demo-

cratic principles—citizen-led, citizen-driven governance.

Recent survey information suggests that citizens still approve; over 60 percent of Missourians surveyed were satisfied with the job of the Missouri Department of Conservation. Importantly, 93 percent reported an interest in Missouri's fish, forests and wildlife and 91 percent agree that it is important for outdoor places to be protected.

To keep your trust, the Department commits to remain open as we conduct business and to involve Missourians in conservation decisions. I think Mr. Allen would approve.



A 1976 initiative petition allowed Missouri voters to establish a dedicated tax for conservation.

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Reflections

DITTANY REMEDIES

Do you know anything about a wild plant called mountain dittany?

My mother used to make tea out of it for bad colds.

Don Branstetter, Warsaw

*Editor's note: The dittany that grows in Missouri, as well as all over the eastern and southeastern U.S., is *Cunila origanoides*. Mountain dittany is probably another common name for this species. The plant, which is in the mint family, has been used medicinally for centuries to treat headaches, fevers and snakebites. There is no information about its effectiveness. Many herbal remedies have not been scientifically tested.*



"S" IS FOR "SNAKE"

Ron Newman of Columbia photographed this red milk snake climbing up a natural rock wall near his house. He said the family lives on a ridgeline overlooking the KATY Trail and Missouri River.

MANTIS SCIENCE

Thanks for the article on praying mantises. My neighbor recently found one of the egg cases in my yard and, after examining it, we tossed it in the grass. When I saw the article, I went out and poked the egg case into a pyracantha shrub. I hope we didn't destroy the mantises inside the case.

I wish the article had emphasized that mantises are harmless. I was at a picnic last year where a couple of teenagers saw a large one and reacted with horror. I picked it up and let it stroll along my arm. They said, "That thing'll kill ya."

I explained that they only ate insects, but I don't know if it sank in. I was surprised that such superstition still exists. They must not have gone to school in Licking, where the science teacher knows better.

Lois Malone, Licking

FLIGHT PLAN

Someone told me that they read in the Conservationist that hummingbirds travel south for the winter on the backs of geese, nestled in their feathers. Is this true?

Karen Jarrett, Mountain Grove

Editor's reply: Hummingbirds do not hitch rides on geese. The little birds travel to the tropics and back under their own power. They fly low while geese usually fly high. Hummingbirds also tend to winter farther south than geese. The amazing distance of their migration and their small size likely led people to believe that hummingbirds receive travel assistance.

WHICH EYE?

I am right-handed and am right eye dominant, but for some unknown reason I naturally shoot left handed. You guessed it—totally messed up.

A wrong eye dominance can be overcome while shooting a rifle or pistol, but a shotgun at flying targets gets



Praying mantis

to be a problem. The experts say that one should shoot a shotgun with both eyes open in order to judge distance and angles better.

My Dad tried to get me to shoot right handed, but it was just too awkward. Bringing the gun to the left shoulder just seems natural.

The 7-year-old mentioned in your article has a long road ahead of him. At least he will always have a built-in excuse for missing a target.

Tim Baker, Springfield

TURKEY TREAT

Your article about cooking wild turkey looked so delicious it made my mouth water.

I have to agree there's more good meat in a turkey than the breast. We made "Cashew Turkey" out of the breast meat, and then I cooked the rest of the meat in a slow cooker so it would be tender.

Sharon Miller, Crane

PLACING A NAME

I have read about the 150-pound blue cat that your article said Dr. "JGW" Steedman bought at a Missouri fish market. Actually, Steedman's name was Isiah George Washington Steedman.

(IGW Steedman.)

Steedman, Missouri, is named after IGW Steedman's son, Edwin Harrison Steedman. Dr. Steedman is buried in Bellefontaine Cemetery in St. Louis. He was my great-great grandfather.

Dick Sant, Crestwood

RELIEF

Being a Brownie leader I was especially interested in reading "Missouri's Most Irritating Plant." I had thought that the 5 leaf vines growing up many of the oaks leading down to Table Rock Lake were poison oak. I am now gratified to know that poison oak has not been seen in Stone County.

Cathy Morton, Branson West

GIVING GOOD

Even though I'm only 15 years old, I have contributed to your Share the Harvest program since I was 11.

I'm very fortunate to have what I have, and giving venison to the hungry makes me feel that I've given something back.

As long as I live to hunt, I will give all I can.

David Schallenberg, St. Clair



SHARE THE HARVEST

The letters printed here reflect readers' opinions about the Conservationist and its contents. Space limitations prevent us from printing all letters, but we welcome signed comments from our readers. Letters may be edited for length and clarity.

Ask the Ombudsman



Q: What are the regulations for boats and motors on Conservation Department lakes?

A: Special regulations for conservation areas are found in Chapter 11 of the *Wildlife Code*. Here's an excerpt pertaining to boat and motor use that covers most (but not all) Conservation Department lakes:

"3 CSR 10-11.160 Use of Boats and Motors ... only electric motors are permitted on lakes and ponds of less than seventy (70) acres. Electric motors and outboard motors are permitted on lakes of seventy (70) or more acres ... Outboard motors in excess of ten (10) horsepower must be operated at slow, no-wake speed, ..."

For the electronic version of the *Wildlife Code* please see www.sos.mo.gov/adrules/csr/current/3csr/3csr.asp.

Matters pertaining to general boating regulations, such as registration requirements and mandatory boater education, are handled by the Missouri State Water Patrol. You'll find their site on the Web at www.mswp.state.mo.us/, or you can call them at 573/751-3333.

Note to fishing tournament organizers: A Regatta Permit from the Missouri State Water Patrol provides for safety and better distribution of activities and is a requirement for state waters.

Ombudsman Ken Drenon will respond to your questions, suggestions or complaints concerning Conservation Department programs. Write him at P.O. Box 180, Jefferson City, MO 65102-0180, call him at 573/522-4115, ext. 3848, or e-mail him at <Ken.drenon@mdc.mo.gov>.

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All About Albinism

Animals that are white instead of their normal color quickly capture our attention and imagination. Albinos are rare, but common enough that almost everyone has seen one, or knows someone that has.

Albinos have the characteristics of other members of their species, except that their cells are unable to produce melanin, a dark pigment that results in normal coloration in the skin, scales, eyes or hair. A lack of melanin usually causes an animal—or parts of an animal—to appear white or pink, or to have a bleached look.

Animals can be pure or partial albinos. Pure albinos usually have pink eyes, nails, scales and skin. They're pink because, without coloration, the blood vessels show through. In humans and some other animals, the eyes of an albino are light blue or green because of the way light passes through the iris.

Partial albinos have some of the coloration typical of their species, but parts of their body appear white. Piebald deer, which have splotches of white on their fur as adults, are a good example. Many red-winged blackbirds have a partially white wing, and partial albino raccoons will have a white patch on their fur.

Being white doesn't make an animal an albino. The true test is whether it has pink or light blue eyes.

Albino animals lack the genes for normal coloration.

by John D. Miller



White is an uncommon color for animals like this turtle (left) and squirrel. Without natural camouflage, albino animals become easy targets for predators.

JOHN D. MILLER

Leucistic animals have mostly white skin, hair or scales, but will have some dark pigmentation in their eyes and nails. Though leucistic animals are not as rare as true albino animals, many are displayed at zoos.

An Inherited Trait

Albinism is passed genetically from parents to offspring. Each cell contains numerous pairs of genes, one from each parent. These genes transmit traits through generations. An albino offspring results from a specific combination of genes.

Albinos are infrequent because the genes for that trait are recessive, while the genes for normal pigmentation are dominant. If both are present, normal pigmentation occurs. If only recessive genes occur, albinism may result. Only a small percentage of animals carry the recessive gene, so the chance of the pairing of recessive genes in an

individual animal is slight.

In humans, for example, about one in 70 people carry a recessive gene for albinism, and about one in 20,000 humans are albinos.

At least 300 species of animals in North America have albino individuals. In Missouri, people have photographed or witnessed albinism in turtles, catfish, salamanders, deer, frogs, snakes, bluebirds and raccoons.

The degree of albinism varies among animal groups. Some researchers working with mammals estimate that true albinos occur in about one in 10,000 births. Some of our Conservation Department hatcheries have seen albino catfish produced as frequently as one in 20,000 fish. Yet some researchers working with birds found that albinism occurs in 17 of 30,000 individuals, or one of 1,764 birds.

Normal- or random-breeding usually decreases the chance for albino offspring. Inbreeding among small isolated populations, or among closely related individuals, can increase the chances for albinism. Even among humans, albinism rates vary with geographic location.

Animals in some areas have extremely high rates of albinism. In

Marionville, for example, white squirrels dominate the population. The number of these partial albinos remains high because people living there feed and pamper their white squirrels and have passed ordinances to protect them from hunters and motorists.

Perils of Albinism

Lacking protective coloration, albino animals are more likely to be seen by both predators and prey. It's easy, for example, to spot Marionville's albino squirrels against the dark trunks of the trees they climb.

Although it seems logical that albinos would have a survival disadvantage, some studies suggest that albino animals may not be as conspicuous to other predators as they are to us.

Predators such as hawks, for example, may rely on a search image for prey that primarily involves shape and movement. The color of the prey may make little difference, as long as the prey looks and acts like a food item.

A lack of pigmentation can, however, affect the vision of albino animals, making it hard for them to find food and avoid danger.

Dark pigments like melanin also help to protect skin and eyes from overexposure to sunlight. Many albino animals face a higher risk of melanomas and retinal damage. In the case of some albino reptile species that bask in the sun to warm themselves, sunlight may quickly prove fatal.

Albinism also may make life more difficult for some birds and other animals that use color to attract mates. Several of our songbird females select males based on their courtship displays. Having a display missing a crucial splash of color may put the animal at a competitive disadvantage.

Appreciating Albinos

Because they are rare, albino animals have often been given mythical status. Many American Indians, for example, considered white bison to be sources of immense power and good fortune. To do harm to them would bring misfortune.



JULIE MELLBERG



JIM RATHERT

Although rare, albinism seems to occur in most species, including deer and amphibians.



Animals that are legal to be bought or sold can bring a higher price if they are albinos. Breeders of amphibians and reptiles for captive animal markets often test and select for albino offspring. Several zoos proudly keep albino specimens.

Modern-day hunters sometimes see albino animals. They can harvest them during legal hunting seasons,

except, as in Marionville, where the albino animals are protected by local regulations.

Because they lack color, albino animals have a ghostly beauty. Many people count themselves lucky to see one. You can increase your chance of discovering one of these rare oddities of nature by spending more time outdoors. ▲



JOHN D. MILLER

Some animals, like this finch and copperhead, exhibit partial albinism.

TYPES OF ALBINISM

Feature	<i>Albino</i>	<i>Leucistic</i>	<i>Partial Albino</i>
Hair, skin, scales	White or pink all over	White or pink all over	Small portions or patches of white
Eyes	Pink	Usually blue	Normal colors
Genetics	Little or no ability to produce color	Little ability to produce color	Ability to produce most normal colors

An aerial photograph of a wide, muddy river. On the left bank, a paved road runs parallel to the water, bordered by a dense line of green trees. In the center of the river, a long, narrow island of green trees stretches across the water. To the right of the island, the river widens significantly, and the surrounding land is flooded, with water reaching the edges of fields and some trees. The sky is overcast and hazy.

Keeping **THE** Connection

Streams need their floodplains—and so do we!

by Sherry Fischer

Usually, the only time floodplains—the flat or low-lying areas next to streams—come to our attention is during floods. When rising waters are not threatening property or lives, it's hard to remember floodplains exist, much less how important they are to the health of our streams.

As they meander through valleys, streams naturally create their own floodplains. No heavy equipment or detailed project plans are needed!

These low-lying areas are called floodplains because they naturally flood when water levels top the stream's banks. This function of collecting excess water is important. It reduces the amount of water that surges downstream.



Flowing water contains a lot of energy. The faster it flows, the more erosive and damaging it can be. Floodplains allow water to spread out and slow down, reducing its potentially destructive force.

Although much of the water that disperses into floodplains eventually returns to the river, some of it soaks into the ground. The amount of infiltration that takes place depends on soil types, land use and vegetation. Water that soaks into the ground doesn't race downstream, where it can cause damage. As a bonus, floodplain infiltration helps recharge our groundwater supplies.

As the water that enters a floodplain slows, the sediment it carries drops out. Each flood brings more sediment, enriching and deepening the soil.

Forests in floodplains are used by wildlife more than any other habitat type. These areas are home to mammals, reptiles, amphibians and insects. Many fish species also use flooded areas for spawning, nursery sites, feeding and refuge.

Vegetation, leaves, twigs and other organic material washed from the floodplain add nutrients to the stream system. These materials form the base of a stream's food chain, providing forage for insects and crustaceans. Just as a stream nourishes its floodplain, a floodplain nourishes its stream.

Signs of Disconnect

Given the importance of floodplains to streams, and the natural interaction of the two, it seems ill-advised to separate them. Yet we've found many ways to disconnect streams from their floodplains.

For example, many of our streams are lined with levees. These embankments contain the flow of streams



CLIFF WHITE

Flat, fertile bottomlands are good for growing crops. Farming is considered a low-impact use of bottomlands.

and keep the water out of the floodplain. Levees often protect urban, industrial or agricultural areas, but at a price. Depending on the height of the levees, their distance from the stream and whether they constrict both sides of the stream, they interfere in some way with the natural function of the floodplains.

Simply clearing vegetation from the floodplain reduces its ability to slow floodwaters and filter them. Not only will flood currents be faster and more destructive, but without vegetative roots to help hold them in place streamside soils also will be more vulnerable to erosion.

We've also dammed rivers. Both flood control and hydroelectric dams change stream flows dramatically. Many of these rivers no longer have a natural stream flow. Instead, their levels rise and fall based on flow release schedules from upstream dams. The benefits of periodically inundating these floodplains has been reduced or completely eliminated.

Smaller dams built to create lakes or ponds also change water flow, although their effects aren't as dramatic as big dams. The impact of numerous small dams can be seen during drought years when they hold runoff, which is then lost to evaporation.

Often overlooked but hugely important are the high flow channels in floodplains. These secondary channels contain water only when stream levels are extremely high. They are necessary for storing excess flow and scattering energy.

High flow channels only function sporadically so people sometimes believe that it doesn't hurt to fill or block them. The result is that all the water and energy of even moderate



CLIFF WHITE

Levees contain a river, but they also disconnect it from its natural floodplain.



Dams have altered many river systems. Varying flows would mimic natural water fluctuations downstream.

floods remains in the main channel where it can scour and erode stream banks.

What Can We Do?

The floodplains of most of our developed stream systems have already been altered, but that doesn't mean we should give up on them. Just because past disconnections have taken place doesn't mean we can't work to improve the connections. They just require some special effort.

For example, we can "notch" levees or set them back from the stream to allow for periodic inundation of the floodplain. The benefits here will be greater where floodplain areas have not been highly altered.

Many riverside communities have learned to use their floodplains for parks, ball fields, agriculture and other facilities that can withstand some flooding. During future floods, their recovery effort and expenses will be far less than if the floodplains were filled with homes or businesses.

One benefit of these kinds of low-impact uses is that vegetation usually remains on riparian corridors, the areas immediately adjacent to the stream banks. In the absence of a healthy, well-vegetated, functional floodplain, riparian corridors become especially important in controlling water temperatures, filtering and storing excess nutrients and sediment, providing wildlife habitat and stabilizing soils.

We also need to avoid blocking or filling high-flow channels and to remove natural or constructed blockages already in place.

It may be feasible to remove smaller dams or dams that are no longer functioning. Varying flow levels on larger dams would allow downstream areas to experience natural, seasonal fluctuations in water levels. We can also modify dams so they don't hinder fish movement.

The Ultimate Goal

Streams eventually flood. Squeezing a river and depriving it of its natural floodplains is like thumbing the end of a water hose. It dramatically increases the force of the water, making even a minor flow powerful enough to cause damage.

Floodplains naturally regulate rivers and buffer floods. When allowed to remain connected to the stream, floodplains benefit our natural stream habitats, as well as the budgets and infrastructure of our stream-side communities.

It often takes a flood to remind people of the value of floodplains to a stream or river, but we don't have to wait until disaster strikes to take action. Communities that keep streams and floodplains connected suffer less damage when the water rises, and their citizens have a wonderful resource to enjoy and appreciate throughout the year. ▲





Otter Appetites

Shaking off misconceptions about the kinds of foods Missouri's otters eat.

by Nathan M. Roberts, photos by Jim Rathert

Just 20 years ago we had fewer than 100 otters in Missouri. Most of them lived in the Bootheel. Now thousands of river otters inhabit streams, rivers and reservoirs throughout the state. River otters weigh 20 to 30 pounds and consume about 2.5 pounds of food a day. That adds up to a lot of vittles, prompting many people to ask, "Just what are all these otters eating?"

To answer that question, the University of Missouri and the Missouri Department of Conservation's Resource Science Center conducted an extensive study of otter diets. Over a two-year period, we collected

4,750 river otter scats (droppings) from 80 miles of Ozark streams. In addition to finding out what otters mainly eat, we also wanted to see if their food preferences changed with the seasons.



Crayfish are the food of choice of Missouri's otters—even in winter.



Although crayfish are their primary food, otters will eat anything that catches their eye. Our study found remains of ducks, frogs and muskrats in otter scat samples.



Otters really eat everything. We found remains of crayfish, fish of all kinds, frogs, ducks, muskrats, snakes, and even a turtle in the scat we collected.

By far the most important food item for otters in the Ozarks, however, is crayfish. During the summer season, we found crayfish remains in more than 98 percent of otter scats. Even during the winter, crayfish remain an important prey item. On the Big Piney River, crayfish remains were found in 75 percent of scat samples. On the Osage Fork, crayfish were found in 92 percent of winter scats.

No other study has found crayfish to be as important in the diet of stream otters. The reliance on crayfish during the winter was especially surprising because crayfish are less active then.

Otters, however, eat whatever is available, and Missouri Ozark streams contain lots of crayfish. They have among the highest production and population densities recorded anywhere. Although most crayfish burrow into mud to wait out the winter months, the two main species of crayfish that inhabit the Big Piney and Osage Forks rivers hide under rocks and debris where otters can easily find them.

FISH

Our Ozark otters also eat fish, but their consumption of fish varies a great deal through the year. During the summer, only 14 percent of scats collected contained fish remains. However, during the winter season 84 percent of scats from the Osage Fork River and 88 percent of scats from the Big Piney River contained fish remains.

Otters in the Ozarks eat several types of fish, including sunfish, suckers, carp, minnows, topminnows, catfish, darters, mosquito-fish, drum, shad and bass. Anglers have reported otters eating bass for years, but until recently it has been impossible to confirm this by the remains in otter scat. Recently, however, researchers have developed a new technique that can identify fish species by examining the position, shape and patterns of near-microscopic formations on scale surfaces.

Using this new technique, we found that 9 percent of scats from the Osage Fork River and 12 percent of scats from the Big Piney River contained bass remains. The remains of rock bass (goggle-eye) appeared in 7 percent of scats from the Osage Fork River and 13 percent of scats from the Big Piney River. Suckers occurred in 4 percent and 7 percent of scats from the Osage Fork and Big Piney Rivers respectively.

Although the study confirms that otters eat bass and rock bass, it could not determine the impact that otters have on bass populations. That would take a much more comprehensive study of bass populations.



Otters also eat fish—especially in winter, when more than 80 percent of scat samples contained fish remains.

AMPHIBIANS

Like many Missourians, river otters seem to enjoy the taste of frogs. We found frog remains in 10 to 14 percent of scats, regardless of season. Apparently, even in winter, the relatively warm ground and spring water that feeds these Ozark streams keeps frogs active and available to otters.

OTHER FOODS

Otters also seem to enjoy a little variety in their diet. Small percentages of the scat samples examined included remains of ducks, muskrats, snakes and even a turtle.

Ducks, muskrats, and snakes have been reported in other studies across North America. Only once before, in Florida, have turtles been reported in otter diets.

The turtle we found proves the rule that otters are opportunistic and will take advantage of almost any kind of food they can find. That makes it difficult to say with certainty exactly what otters eat. However, after collecting and examining 4,750 scat samples, we have a better understanding of otter diets. The data we collected will help wildlife managers and biologists manage populations of these furry feeders in the future. ▲





*A Green heron's
feeding strategy is
to wait and eat.*

The Waiting Game

by Jim Rathert

I'd stalked slowly and carefully along the shoreline of a marshy slough to photograph wood ducks. I settled into a natural hide, getting as comfortable as I could in the mud, and began my vigil. The wood ducks remained out of camera range, but while I waited I caught a slight movement in the corner of my eye. Just 35 feet away on the far bank was an adult green heron. It was waiting there—just like me.



The green heron stopped and started its way along the river's edge as it searched for fish, frogs or just about anything else for its next meal. Each time it halted, it assumed a crouched and horizontal posture with its head and neck recoiled for a strike. Most of the time it stood perfectly motionless. For the next 35 minutes we both waited—the heron for prey and I for a photograph. Finally, its head jabbed forward into the shallow water, making a small splash. I was surprised to see that the bird came up empty. Had it wasted 35 minutes? I knew I hadn't.



Green herons are one of a few bird species that use lures or bait to attract prey. They place their own feathers, insects, earthworms, twigs—even bread or popcorn—to attract fish within range of their spear-shaped bill. They usually grasp their prey, rather than spear it.

Green herons often perch just above the water. The waiting green heron in this series of pictures was rewarded with a small bug. Green herons prey on a wide range of invertebrates, including leeches, earthworms, water bugs, snails and diving beetles. Fish and frogs account for most of their diet.





When they feel threatened, green herons raise their crest feathers and flip their tail feathers.

Standing and waiting is the most common hunting strategy employed by green herons. Ornithologists have observed 15 distinct feeding strategies among these birds. These include walking quickly, plunging, diving feet-first, stirring the water with their feet and even swimming in the pursuit of food.



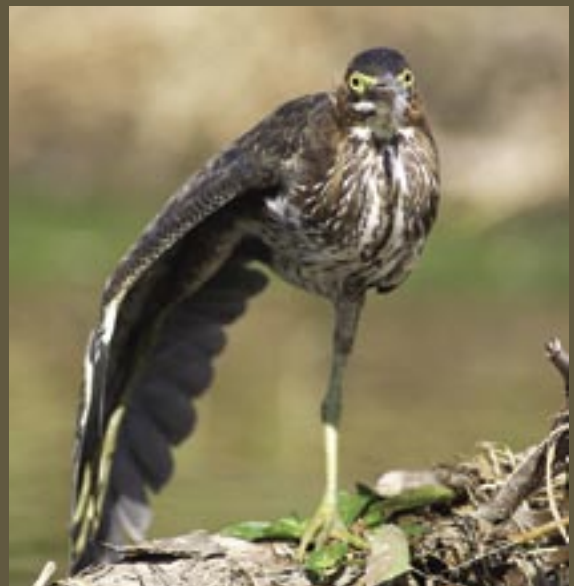
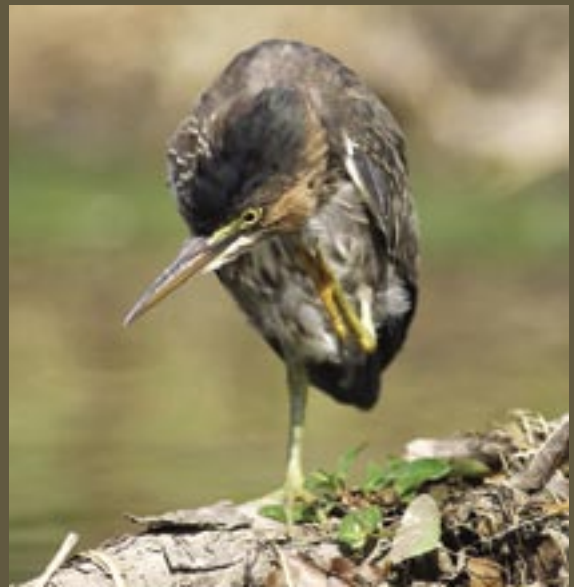






Nestlings develop rapidly. They leave the nest 16 or 17 days after hatching and are capable of flight at 21 or 22 days. The young birds shown at left retain their downy feathers amid their developing juvenile plumage.

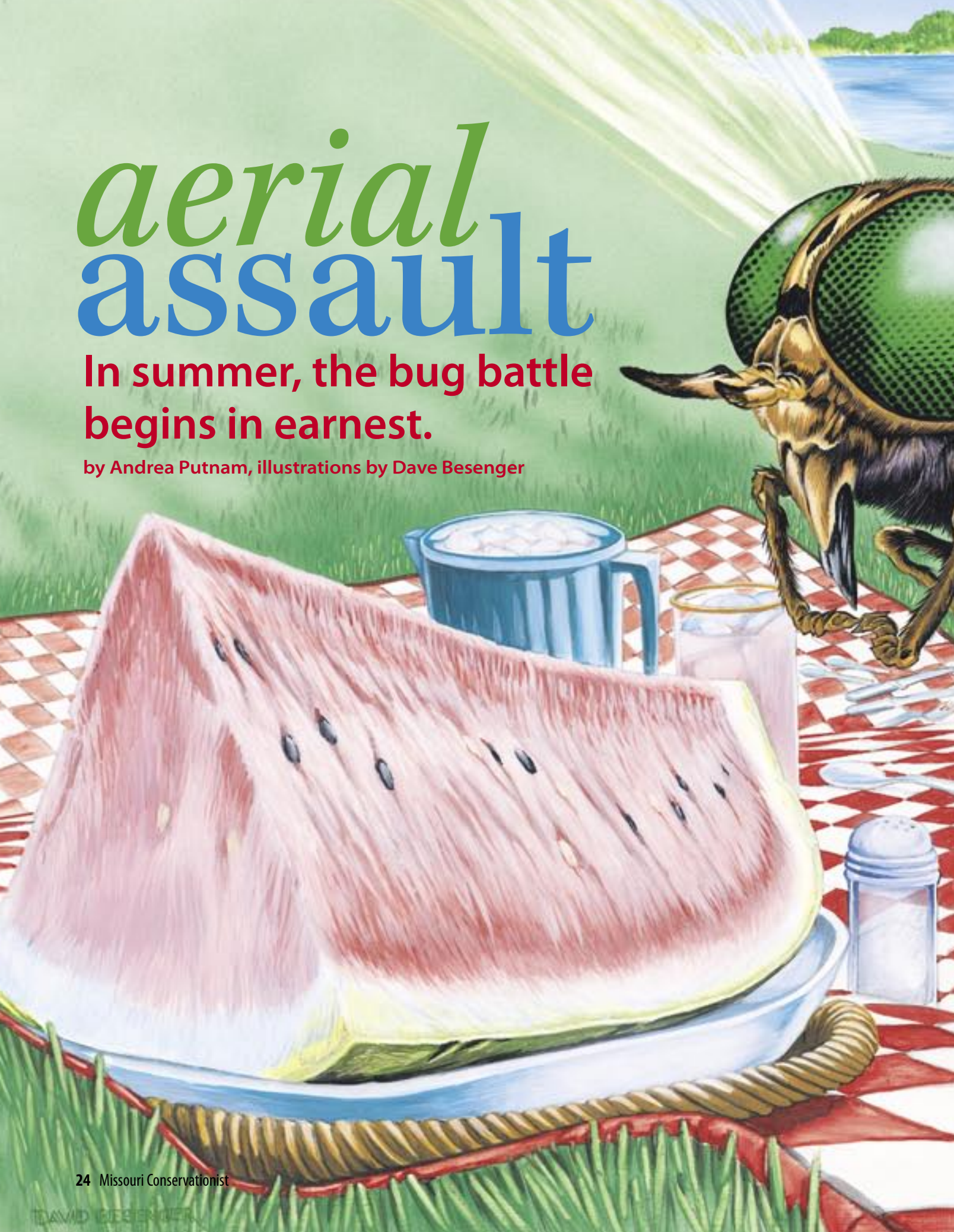
The pictures of preening at right show a green heron grasping its breast feathers at their base and swiping them to the tip. The heron then scratched its head with its middle toe, stretched, shook its feathers and extended a wing.



aerial assault

In summer, the bug battle begins in earnest.

by Andrea Putnam, illustrations by Dave Besenger





Pull on your long pants, put on a long sleeved shirt and douse yourself in bug spray. We are entering the bug season.

As summer approaches, we find ourselves preparing for a relentless aerial assault of flying insects. Pesky battalions of bugs take aim at our skin, causing fear and fury, as well as irritation and discomfort.

Mosquitoes, horseflies and midges are among the many annoying pests we encounter when we venture outdoors. The best defense against having our summer days spoiled by these insects is to learn their behaviors and habitats—and what you can do to avoid getting bit.

Skeeters

Mosquitoes are on everyone's not-very-nice list. These small, flying insects are actually a type of fly. Mosquitoes normally feed on plant nectar, but the females need a blood meal before they can lay fertile eggs. The females are alerted to potential blood donors primarily by movement, heat, odor and exhaled carbon dioxide.

When a female mosquito finds a victim, she pierces its skin with her long, thin proboscis—or nose. The female's saliva eases penetration and keeps the victim's blood from clotting. She draws blood out as if through a straw, filling her abdomen. If you watch, you can see her abdomen become reddish as she feeds. Males have smaller mouthparts and aren't able to bite.

Missouri is home to about 50 different species of mosquito, but all of them have similar life cycles, developing through egg, larva, pupa and adult. The egg, larval and pupal stages are spent in pools of standing water before an adult mosquito emerges.

Most mosquitoes only live a few weeks as adults, so you'll experience several generations through a Missouri summer. Some mosquitoes survive through winter as adults, eggs or larvae.

A mosquito bite results in a wheal, a small swelling mound, that itches. The swelling and the itchiness persist until our immune system breaks down proteins in the mosquito's saliva.

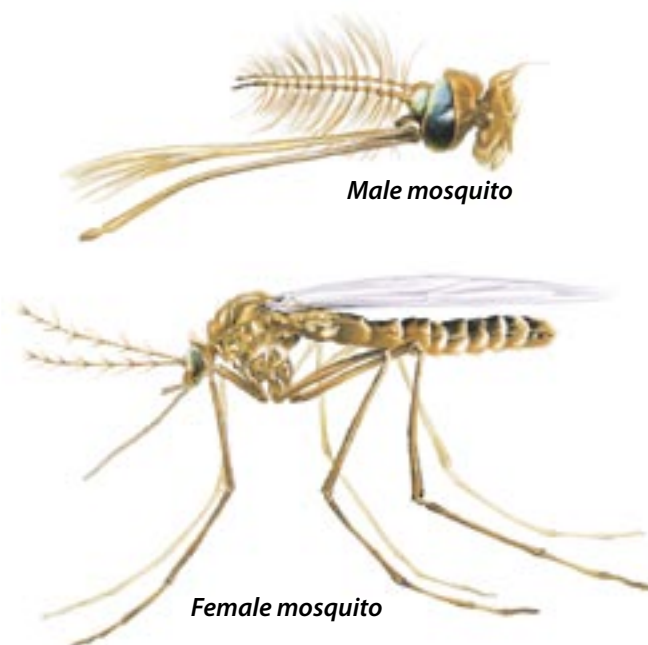
Worldwide, mosquitoes are a major transmitter of diseases, including malaria, yellow and dengue fever and encephalitis. They also transmit diseases to dogs, birds, horses and other animals.



Female horsefly

Male horsefly

Female horsefly eyes, as seen from above, are divided, but male horsefly eyes meet without a distinct division. Mouthparts also differ. The female's are able to pierce skin.



Male mosquito

Female mosquito

A close look at the antennae of a mosquito will tell you its gender. Male mosquitoes have feathery antenna. The antenna of female mosquitoes have sparse hairs.

When mosquitoes are annoying us, it's hard to think of them as beneficial, but mosquitoes do pollinate flowers and provide food for bats, turtles, fish and birds.

It's still okay to swat them, though.

Horse and Deer Flies

The bite of these pesky critters can make you feel like you've been kicked by a horse. As is the case with mosquitoes, only the females seek blood. Males drink plant liquids, such nectar or honeydew.

Horse flies are usually bigger than deer flies, which are slightly larger than house flies. Horse fly wings are clear, while deer fly wings have dark markings or patterns. As their name suggests, horse flies usually attack livestock. People apparently make a good target for deer flies, especially on or near streams or at the beach.

The bite of these flies is very surgical. The fly's mouthparts act like scissors and a sponge. After cutting the skin, the female fly soaks up blood, which flows more freely because of anti-clotting proteins in their saliva.

The airborne attack of horse flies occurs around Missouri's rivers, lakes and streams, which are prime breeding habitat.

Horse and deer flies usually lay their eggs on vegetation near water. After the eggs hatch, the larvae feed on almost anything organic they can find in muddy soil. They may remain in the larval stage through winter or, in the case of some species, as long as three years before maturing. The flies are usually abundant for only

a month during the summer. Deer flies peak and decline before horse flies.

As is the case with any biting insect, deer and horse flies can spread disease. They are even suspected of transmitting Lyme disease.

These flies, especially in the larval stage are an important food sources for frogs, turtles, fish and birds. On the other hand, they are absolutely irritating when they buzz around the head and shoulders area. Good luck trying to slap them; they are agile and elusive.

Midges and Gnats

The clouds of insects, usually called midges or gnats, that you sometimes see and walk through have the unique ability to annoy without biting. These tiny flies bombard your face when you're hiking or bicycling. During their mating season, clouds of midges seem to hang in the air.

Most midges do not bite or pierce the skin of humans, but they seem to home in on body cavities when you walk into the cloud. They produce high-pitched buzzing sounds in our ears and irritate our noses and eyes.

Midges feed on live or dead vegetation and seem to follow moisture. They complete their life cycle in wet areas and often show up after a few days of wet weather. Some species also seem to be attracted by lights. Midge numbers decline following dry spells.

These insects are a staple in many animals' diets including fish, turtles, frogs and birds. Sometimes people accidentally swallow them, too.

Venture Forth

Don't let a few gazillion pesky insects keep you from Missouri's wonderful outdoor recreational opportunities.

Defend yourself against aerial assault by wearing long pants and long-sleeved shirts when outdoors. You can keep deer flies from their favorite perch—the top of your head—with a hat. If you expect the bugs to be extra bad, wear a mesh head net or even a mesh body suit. Use mosquito nets or similar netting around your picnic table and sitting areas (away from fires) when camping.

Most insect repellents contain diethyl-toulamide (DEET) in concentrations that range from less than 5 percent to 100 percent. The stronger the concentration, the longer it will keep insects from biting you.

DEET can cause blisters, clogged or runny noses, shortness of breath, reddened and tingling skin or other serious reactions in some people. Use the lowest concentration that will work and apply it sparingly in well-ventilated areas. Use 10 percent or less DEET on children. Use small amounts of repellent and keep it away from eyes, mouth, nose, open cuts and sores and food.

Natural repellents usually contain some combination of essential oils, such as citronella, eucalyptus, lavender or soy. They keep insects from biting, but only for a short time, so you need to reapply them often.

Generally you can make yourself less attractive to biting insects by not wearing perfumes or scented lotions. Insects are attracted to shiny objects, so leave your jewelry at home. Light, earth-toned clothing is probably your best choice for clothing. Dark colors attract flying insects, such as deer flies.

Reduce mosquito numbers on your property by eliminating standing water in flowerpots, buckets or other water-collecting containers around your home. Change the water in your bird bath weekly. This eliminates breeding habitat for flying insects.

Do not over-water your lawn. Immature gnats and midges can develop in moist or wet soil. Keep your lawn cut short so adult mosquitoes cannot hide in it. Stock ornamental ponds with fish that eat mosquito larvae.

Chemical treatments, in most cases, are only a temporary fix to your insect problem. Most applications only kill the insects that they come in contact with. Covering exposed skin or protecting it with repellents and eliminating breeding habitat are the most effective ways of dealing with summer's aerial assault of insects. ▲



Most midges don't bite. They resemble mosquitoes, but are smaller. At rest, their wings extend sideward, unlike mosquitoes, which fold their wings over the back.



Missouri youth hunters top nation

Although most states are losing hunters, Missouri leads the nation in encouraging youngsters to hunt. These young hunters should help keep the hunting tradition strong in the state.

A study commissioned by the National Shooting Sports Foundation and the National Wild Turkey Federation gauged hunter-replacement ratios across the country. The study determined the ratio of the number of people age 16 and older who hunted in a recent year to the number of youngsters between the ages of 6 and 15 who hunted that year. The national ratio is .69, which means that in most states there are not enough young hunters in the ranks to sustain hunter numbers.

The implications of this ratio are serious. States where the percentage of hunters declines will lose out on the recreational value of hunting. They also lose the economic benefits of jobs, manufacturing, services and tourism associated with hunting. Furthermore, declines in hunter numbers could reduce the ability of wildlife management agencies to control wildlife populations, such as deer and coyotes.

Only seven states showed a hunting participation ratio that indicates growth in the number of youth hunters. Missouri is at the top with a replacement ratio of 1.16.

Missouri's hunting seasons exclusively for young hunters, as well as Conservation Department programs like Hunter Skills University and Missouri's Outdoors Women, likely contributed to our top standing.

FISHING IS FREE JUNE 11 AND 12

Anglers who fish the weekend after the first Monday in June can leave their fishing permits at home.



June 11 and 12 are Free Fishing Days in Missouri. You can fish without a fishing permit, daily trout tag or trout permit at any conservation area and most other places in the state. Requirements for special permits still may apply at some county, city or private areas. Normal regulations, such as size and daily limits, still apply everywhere.

A News & Almanac item in the May *Conservationist* listed incorrect dates for this year's Free Fishing Days.

Scam targets deer permit seekers

If you hear about a toll-free telephone number where you can get free deer hunting permits, don't believe it. A scam is circulating that promises free deer permits but ends up charging callers for an unrelated adult service. Deer permits are available only through the Conservation Department or designated vendors.



Forest ReLeaf plants 50,000th tree

Drive by the intersection of Natural Bridge and Vandeventer in O'Fallon's Fairground Park, and you may glimpse a landmark of sorts. The red maple seedling planted there last Nov. 9 has not attained impressive size yet, but it is nevertheless significant.

The tree is the 50,000th planted through the efforts of Forest ReLeaf of Missouri. The organization's tree-planting and education programs help citizens take an active role in greening up their communities. The 50,000 trees planted so far grace school grounds and parks, roadsides and other green spaces throughout Missouri. The group works with public forestry systems, cities, schools, churches, civic groups and individuals.

Forest ReLeaf offers free and reduced-cost trees for planting on public and nonprofit property. To learn more about this organization and its community nursery near Lambert-St. Louis International Airport, visit www.moreleaf.org, or call 888/473-5323.



PARTNERS FOR PALLID STURGEON

The Conservation Department and the U.S. Army Corps of Engineers are part of a coalition of government agencies working to learn more about the endangered pallid sturgeon and coax the species back from the brink of extinction.

The agencies are working together to assess the health of pallid sturgeon populations in the Missouri River from Fort Peck Dam in Montana to the river's mouth near St. Louis. They are gathering information about sturgeon numbers and changes on the river that could affect the fish's survival.

The Corps of Engineers is paying for improvements to the Conservation Department's Blind Pony Hatchery. The facility in Saline County raises pallid sturgeon for release into the Missouri River.

Other agencies involved in the project are the U.S. Fish and Wildlife Service, South Dakota Game, Fish & Parks, and the Nebraska Game and Parks Commission.

Springfield youth wins Arbor Day poster contest



Kristen Meinert, a fifth-grade student at Greenwood Laboratory School in Springfield, is the Missouri state winner in the 2005 Arbor Day National Poster Contest.

A panel composed of members of the Missouri Community Forestry Council and artists selected Meinert's poster as the winning entry. The contest theme was "Trees are Terrific and Energy Wise!" More than 2,000 fifth-grade students participated.

As the state winner, Meinert received a \$50 savings bond from Forest ReLeaf of Missouri. Her poster was displayed at the U.S. Botanic Garden in Washington, D.C., in April.

The Conservation Department provided a tree to be planted at her school. Her teacher, Rhonda Glaser, received a Trees Are Terrific Curriculum Kit provided by The National Arbor Day Foundation.

"Awareness of the relationship of trees and our environment begins at a young age," says State Forester Robert Krepps. "Students like Meinert have learned about the importance of trees to our environment and how they can make a difference."

The National Arbor Day Foundation is a nonprofit education organization dedicated to tree planting and environmental stewardship. Visit www.arborday.org for online learning opportunities.

Trappers condemn dog killings

The Missouri Trappers Association (MTA) has condemned the actions of a trapper who killed two dogs caught in his traps in Cass County earlier this year. The trapper in question was not a member of the MTA.

In a letter to the *Kansas City Star*, MTA Vice President Doren Miller said the killings were "offensive to ethical trappers everywhere" and "an embarrassment to all who practice trapping responsibly." He said the vast majority of trappers do not set traps where they have a chance of catching non-target animals. Furthermore, he said, in rare cases where domestic animals are caught in traps, ethical trappers release them without injury.

Miller said trappers working with professional wildlife managers have made great strides in fine-tuning trap designs to prevent injury to both target and non-target animals. He also expressed "heartfelt sympathy" to the owner of the two dogs that were killed.

Conservationist article inspires award-winning essay

Missouri's dwindling population of greater prairie chickens won't go extinct if Abigail Metallo has anything to say about it. The fourth-grade, home-schooled student from Edgar Springs knows quite a bit about the colorful, prairie-dwelling birds and has some thoughts about how Missourians might reverse their decline.

Metallo learned about prairie chickens by reading the *Conservationist*. She used her knowledge to enter Mutual of Omaha's Wild Kingdom Kids Summit Essay Contest and won first prize at the state level.

The contest encourages youths age 9 to 12 to write about how they can help save an endangered species. Metallo's essay suggests educational projects to raise public awareness of the bird's plight, volunteer work to restore prairie chicken habitat and cookouts to raise money for prairie chicken research. She even provided a suggested cookout menu—complete with prices.

Metallo represented Missouri at the national summit in Los Angeles in May.





Quail aren't alone in decline

Many Missourians, especially quail hunters, know that bobwhite quail numbers have declined significantly in recent decades. However, they are not aware that quail are in decline throughout their native range in the eastern United States and that parallel declines have been documented in dozens of other, seemingly very different bird species.

What these birds all have in common is a need for grasslands that are managed to benefit wildlife.

Bobwhite quail and other declining bird species are all adapted to grasslands. They nest, rear their young and find food and shelter in grasslands. Missouri once had millions of acres of grassland, ranging from tallgrass prairie and savanna to brushy grassland. However, landscape changes over the last 30 years have reduced grassland, leaving bobwhites, dickcissels, shrikes, bobolinks and grasshopper sparrows with drastically reduced living quarters.

To find out what you can do to help quail and other grassland birds, contact the Private Land Services representative at your nearest Conservation Department office or visit www.missouriconservation.org/landown/wild/quail/.

Polled suburbanites OK with hunting

Most suburban St. Louis residents recently surveyed said controlled hunting was acceptable as a way of managing deer numbers in their area. A task force with representatives from 10 west St. Louis County municipalities paid for the survey. Sixty-three percent of respondents said they thought hunting was



acceptable, while 27 percent called it unacceptable.

Biologists say suburban deer populations need to be 25 or fewer per square mile to avoid unacceptable levels of deer-vehicle collisions and property damage. They have documented deer populations as high as 85 per square mile in parts of St. Louis County.

Survey respondents said their top deer management priorities were reducing deer-vehicle collisions, reducing the risk of diseases and maintaining a healthy deer herd.

New conservation area opens in Pemiscot County

The newly created Black Island Conservation Area (CA) in Pemiscot County provides much-needed wetland acreage for waterfowl, as well as a variety of recreational opportunities in the Mississippi River flood plain north of Caruthersville. The new area borders Gayoso Bend CA. The 2,087-acre Black Island is mostly low-lying cropland and forested uplands. Management plans call for restoration of the area's bottomland hardwood forest.

The area will be a haven for swamp rabbits and federally endangered least terns, not to mention birdwatchers, anglers and hunters. Black Island CA also will serve as a holding area for rainwater that otherwise would run off immediately, pushing up flood crests on the Mississippi River.



FEDERAL AID HELPS BUILD QUAIL BUFFERS

USDA offices throughout Missouri are accepting applications for the Continuous Conservation Reserve Program "Habitat Buffers for Upland Birds" practice, or CP33. The program encourages landowners to create strips of native grasses or other wildlife-friendly plants on the edges of crop fields to provide shelter for quail, rabbits and other wildlife.

CP33 provides landowners reliable income from field edges where crop production often is marginal. As little as one side of a field can be enrolled. There is no limit on acreage, but at least one-tenth of an acre of enrolled fields must be planted in shrubs to enhance habitat value for upland birds. Participating landowners plant a mix of native grasses and broadleaf plants in 30- to 120-foot strips along the edges of crop fields. Only land that is currently being cropped qualifies.

Landowners receive \$100 per acre signing bonus plus annual payments for enrolled acreage. For more information about CP33, contact any USDA office.



SIGN ON FOR NATURE JOURNALING ADVENTURE

Missourians can travel back in time 200 years with an all-new adventure booklet, "Journaling with Lewis & Clark: A Discovery of Outdoor Missouri."

The booklet, available at conservation education sites statewide, outlines day trips and activities to get in touch with the saga of the Corps of Discovery. At each site, participants learn about modern-day connections to the expedition. They receive distinctive lapel pins representing plants and animals Lewis and Clark encountered during their journey through Missouri or expedition equipment used by the team.

Those who visit all nine sites qualify for a grand-prize drawing for camping equipment. The program will continue through May 2006. The drawing will be held in September 2006.

To get started, visit the Cape Girardeau Conservation Campus Nature Center in Cape Girardeau, Burr Oak Woods Conservation Nature Center (CNC) in Blue Springs, Columbia Bottom Conservation Area in St. Louis County, the Discovery Center Urban Conservation Campus in Kansas City, Lost Valley Fish Hatchery near Warsaw, Powder Valley CNC in Kirkwood, Runge CNC in Jefferson City, Shepherd of the Hills Conservation Center in Branson or the Springfield CNC in Springfield.

Habitat Hint: New video explains how to feather forest edges for quail

Quail benefit more from a gradual transition between fields and forest than from abrupt field-forest edges. A new Conservation Department video, *Your Conservation Guide to Edge Feathering*, shows you how to create this gradual transitional habitat. The 7.5-minute video comes in VHS tape and DVD versions and is available from Distribution Center, P.O. Box 180, Jefferson City, MO 65102-0180, e-mail pubstaff@mdc.mo.gov.



For more information about managing your land for quail and other grassland wildlife, request a free copy of "On the Edge: A Guide to Managing Land for Bobwhite Quail." For help in implementing the advice contained in the booklet, contact a private land conservationist at your nearest Conservation Department office.

Wildlife not a partisan issue in Missouri

Strong bipartisan support from Missouri's congressional delegation helped ensure the continuation of a federal program that underwrites local wildlife management efforts.

Senators Christopher "Kit" Bond and Jim Talent and representatives Russ Carnahan, William "Lacy" Clay, Emanuel Cleaver, Sam Graves, Kenny Hulshof and Ike Skelton all signed letters supporting an \$85 million appropriation for the State Wildlife Grants program.

The program is designed to benefit species of conservation concern before they become endangered. It makes good economic sense because it encourages "leveraging" federal money through matching grants to local governments and privately supported conservation efforts. A prime example is the creation of the Missouri Bird Conservation Initiative Council grants program.

Missouri has used its share of State Wildlife Grant money to support prairie, glade and savanna restoration, eradicate invasive plants and monitor species believed to be declining.



Breast cancer survivors invited to Casting for Recovery fishing event

Survivors of breast cancer are invited to Casting for Recovery Oct. 14 through 16 at Windrush Trout Farm near Steelville. Casting For Recovery provides no-cost fly fishing retreats designed especially for women who have or have had breast cancer. The events promote mental and physical healing through shared activities and gentle exercise in beautiful, natural settings. For more information, contact Missouri Casting for Recovery Coordinator Patti Hummert, 9601 Flora, Overland, MO 63114, 314/423-5852, or visit www.castingforrecovery.org.



Outdoor Calendar

Hunting

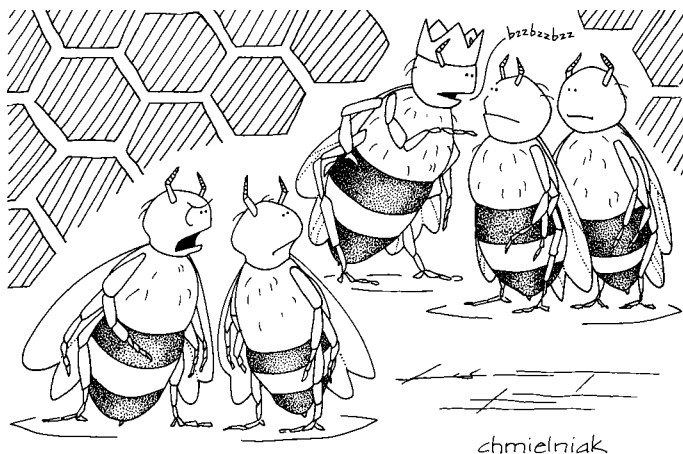
	open	close
Coyotes	5/9/05	3/31/06
Deer/Turkey Archery	9/15/05	to be announced
Deer Firearms	11/12/05	to be announced
Groundhog	5/9/05	12/15/05
Rabbits	10/1/05	2/15/06
Squirrels	5/28/05	2/15/06
Turkey, fall firearms	10/1/05	10/31/05

Fishing

Black Bass (most southern streams)	5/28/05	2/28/06
Bullfrog	sunset	midnight
	6/30/05	10/31/05
Experimental Catfish Hand-fishing Season (on designated portions of Fabius, Mississippi and St. Francis Rivers)	6/1/05	7/15/05
Trout Parks	3/1/05	10/31/05

For complete information about seasons, limits, methods and restrictions, consult the *Wildlife Code* and the current summaries of Missouri Hunting and Trapping Regulations and Missouri Fishing Regulations, the Fall Deer and Turkey Hunting Information, Waterfowl Hunting Digest and the Migratory Bird Digest. To find this information on our Web site go to <http://www.missouriconservation.org/regs/>.

The Conservation Department's computerized point-of-sale system allows you to purchase or replace your permits through local vendors or by phone. The toll-free number is 800/392-4115. Allow 10 days for delivery of telephone purchases. To purchase permits online go to <http://www.wildlifelicense.com/mo/>.



"If you ask me, she's a regular control freak."

COMMUNITY LAKES A HUGE FISHING RESOURCE

If you think you have to drive hours to big reservoirs in order to catch big fish, think again. Ten-year-old Marc Jungle of Linneus caught this 3-pound,



10-ounce black crappie from Che-Ru Lake at Fountain Grove Conservation Area. Fish like this one lurk in many of Missouri's 100-plus Community Assistance Project lakes and ponds around the state. The Conservation Department partners with communities by managing fish

populations in these lakes, which often serve as municipal water supplies. To find CAP lakes in your area, visit www.mdc.mo.gov/atlas/.

AGENT NOTEBOOK

People often ask me why we need conservation agents in urban counties.

I started my conservation agent career in St. Francois County, which is mostly rural, but I've spent the last 17 years in mostly urban St. Charles County. In both places, I helped with hunter education, spoke to students at schools and to other public groups, conducted radio shows, wrote newspaper articles and did wildlife surveys for research.



Both rural and urban areas have public lands that agents patrol for hunting, fishing and area-use violations. People visit both rural and urban conservation areas to watch wildlife, train dogs, target shoot, exercise, photograph nature, collect wild edibles and attend informational programs, as well as to hunt and fish. The only difference is the number of people involved.

Both urban and rural agents respond to animal nuisance complaints. Deer and other animals in highly populated areas sometimes create unique challenges. Imagine rescuing a deer from an empty in-ground swimming pool or catching a black snake on the third floor deck of an apartment. Aggressive nesting geese near workplace doorways often require a large net and a careful approach.

Basically, the job is the same no matter where you're at. Agents in both rural and urban areas enforce wildlife laws on private property and all laws on Conservation property. They inform people, handle wildlife and perform other duties as needed.

The traffic is different, though. At rush hour, an urban agent is no different than the normal urban commuter. — *Dave Guntli, St. Charles County*



Go fishing for smallmouth bass, carp and more!

Go in search of Hellbenders...and see how fire may be an important element to the survival of the collared lizard.

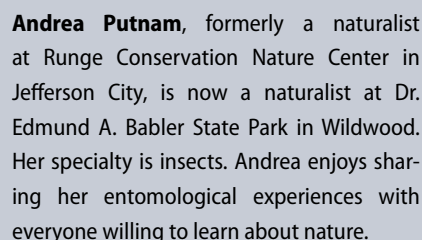
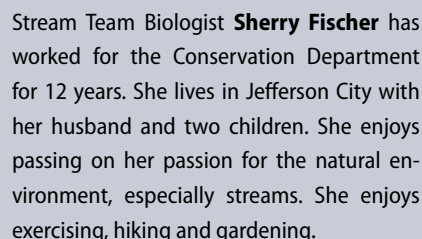
See what you can do to help keep our waterways clean.

Learn more about K.C. Wildlands, CWD and West Nile Virus.

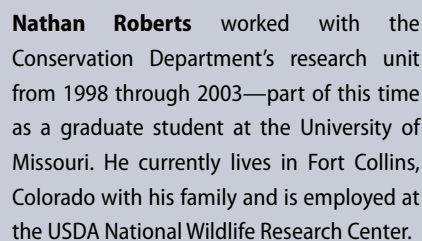
It's reptile week as we take a closeup look at the cottonmouth and collared lizard.

Branson Vacation Channel	Raymore Govt. Access-Channel 7
Brentwood Brentwood City TV	Raytown City of Raytown Cable
Cape Girardeau Charter Cable Ed. Ch. 23	St. Charles City of St. Charles-Ch 20
Chillicothe Time Warner Cable Channel 6	St. Louis Charter Communications
Hillsboro JCTV	St. Louis City TV 10
Independence City 7	St. Louis Cooperating School Districts
Joplin KGCS	St. Louis DHTV-21
Kearney Unite Cable	St. Louis KPTN-LP/TV58
Maryland Heights Cable America 10	St. Peters City of St. Peters Cable
Mexico Mex-TV	Ste. Genevieve Public TV
Noel TTV	Springfield KBLE36
O'Fallon City of O'Fallon Cable	Sullivan Fidelity Cable-Channel 6
Parkville City of Parkville	Union TRC-TV7
Perryville PVTv	West Plains OCTV

Meet Our Contributors



Dr. Robert M. Lenz is a professor of psychology at the University of North Carolina at Charlotte. He has a Ph.D. in psychology from the University of North Carolina at Chapel Hill. His research interests include the development of the self and the role of the family in the development of the self.





Missouri's summer duck

Wood ducks seem to like their woods near water. They frequent wetland forests and the margins of streams and ponds, where you can often spot them searching for aquatic insects. Wood ducks have been reported in every county in Missouri. Wood duck males are gorgeously colored in spring and early summer but molt into a somewhat less gaudy "eclipse" plumage in June or July. — *Jim Rathert*